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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/762,497 | 04/20/2001 | Shojiro Kawakami | FUK-81 | 4970 |
| 22855 | 7590 | 10/21/2003 | EXAMINER | |
| RANDALL J. KNUTH P.C. 3510-A STELLHORN ROAD FORT WAYNE, IN 46815-4631 | | | CURTIS, CRAIG | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2872 | |

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/762,497

Applicant(s)

KAWAKAMI ET AL.

Examiner

Craig H. Curtis

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 14
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2872

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

I. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

With regard to claim 1 in particular (and, of course, to claims 2, 5, and 6, in view of their dependency therefrom), the meaning of the recitation "...the shape of each said layer at least one of having a regularly undulated structure parallel to a first plane; being uniform parallel to a second plane, said second plane being orthogonal to said first plane; and having a regularly or non-regularly undulated structure which has a larger pitch than parallel to said first plane..." cannot be ascertained as same is presently drafted.

Art Unit: 2872

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami et al.'s Fabrication and Observation of 3D Photonic Crystals Composed of Si/SiO₂ with Sub-Micrometer Periods.

Kawakami et al. disclose (see Fig. 1) the invention as claimed, a polarizer and method steps for producing a polarizer comprising:

a multilayered structure along z-axis two or more transparent layers, at least two said layers having different refractive indices (read: indices) relative to one another,

each said layer having a shape, each said layer being a unit of lamination, the shape of each said layer at least one of having a regularly undulated structure parallel to a first plane; being uniform parallel to a second plane, said second plane being orthogonal to said first plane; and having a regularly or non-regularly undulated structure which has a larger pitch than parallel to said first plane; and having a regularly or non-regularly undulated structure which has a larger pitch than parallel to said first plane,

Art Unit: 2872

the lamination along the z-axis repeating the shape, and being configured for acting against the light such that the light thereby has a component whose incidence direction is not zero from the z-axis in the three-dimensional orthogonal coordinates (x, y, z) associated with the polarizer (See Fig. 1);

wherein the polarizer has a first refractive medium layer containing one of Si and TiO_2 as a main component and a second refractive medium layer containing SiO_2 as a main component (see Fig. 1);

said method for producing a comprising the steps of:

laminating a more refractive medium and a less refractive medium with a regularly repeating shape by a film-forming method at least partly including the dry etching on a substrate which has at least one of regularly arranged grooves or regularly arranged linear projections or thin and long projections or thin and long grooves (see Fig. 1, entire document);

laminating a more refractive medium which contains one of Si or TiO_2 as a main component and a less refractive medium which contains SiO_2 as a main component with a regularly repeating shape, said laminating performed by a film-forming method at least partly including the dry etching on a substrate which has at least one of regularly arranged grooves, regularly arranged linear projections, thin and long projections, and thin and long grooves (see Fig. 1, entire document).

wherein the shape of layers at least one of has a regularly undulated structure along said x-axis and is uniform along a y-axis (See Fig. 1);

wherein said first refractive medium layer has a first index of refraction, said second refractive medium layer has a second index of refraction, said first index of refraction being greater than [said]

Art Unit: 2872

second index of refraction (See above; entire document); and wherein said substrate has at least one of thin and long projections and thin and long grooves (See Fig. 1).

Response to Arguments

3. In light of Applicants' amendments to the claims, the rejection of the claims has been maintained as set forth above.

Conclusion

4. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

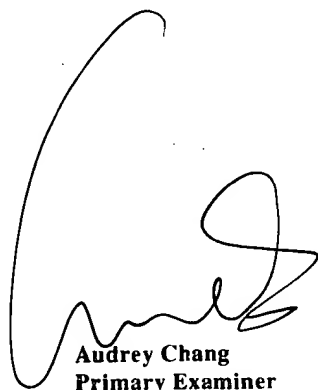
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 2872

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (703) 305-0776. The centralized facsimile phone number for the USPTO is (703) 872-9306.

Any inquiry of a general nature regarding the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read 'Audrey Chang', with a large, sweeping initial 'A'.

**Audrey Chang
Primary Examiner
Technology Center 2800**

QHC.
Craig H. Curtis
Group Art Unit 2872
17 October 2003